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Prevalence of Influenza Vaccination in a High Risk Population: Impact of Age and Race

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Background: Influenza is a known preventable infectious condition that leads to significant morbidity and mortality. Influenza viral infection can cause pneumonia by direct invasion of the lung when the lung's defenses are weak. Bacterial invasion can also cause a secondary pneumonia. Out of every 100,000 persons aged 45 to 64, 1,013 will require hospitalization for community acquired pneumonia (CAP) every year;[1] this rate of hospitalization is 4 times higher than for the general population. In the elderly, this risk is even higher. Influenza vaccination in those over age 65 is associated with an overall societal cost-savings of $80 per person and substantial improvements in outcomes such as hospitalization and death by as much as 33%.[2-6]

Segments of the population who are at increased risk include all persons over age sixty-five years and those younger people with increased risk because of chronic illness or reduced immunity. These include people with diabetes, chronic lung, liver, kidney and heart disease, human immunodeficiency virus, and most cancers. Most hospitalizations of those with lower respiratory tract viral infections occur in those with chronic conditions. The vaccine itself has been shown to be safe for those with asthma [7] and those who are immunosuppressed. [8, 9] It has been shown to be effective in those with pulmonary conditions who are immunocompromised by use of corticosteroids as well as in elderly.[10-12] Influenza vaccine is therefore recommended by the Advisory Committee on Immunization for all those over age 65 and for those aged 18-64 who have a chronic disease.[13]

Attempts at a community level to increase the rates of vaccination of high risk groups appear to be working, though unevenly in certain subpopulations. [14, 15] The goal of complete coverage for high risk groups remains elusive, especially in minority populations.[16, 17] Among those with end-stage renal disease, women and blacks are less likely to receive the vaccine.[18] In a national survey analysis, blacks with diabetes were less likely to receive flu vaccine.[18] Several factors are likely associated with this disparity in use of a known effective strategy to decrease morbidity and mortality in the community. Among them are patient level factors, physician recommendation, and systemic lapses.

This study used a representative sample from one county in the Southern U.S. to examine the following questions: Which individuals in a community sample receive influenza vaccination with high-risk chronic medical conditions, such as diabetes, chronic heart conditions, and asthma? Does race impact the reported reception rates for influenza vaccine? If so, given that age 65 or greater should predict universal vaccination, does age moderate the known racial disparity?

Methods: The Metro Public Health Department conducted a local adaptation of the Behavioral Risk Factor Surveillance System in a random digit dialing phone survey with a sample of 7,901 residents of Davidson County, Tennessee about health-related behaviors. Of those respondents, 7,016 completed surveys were analyzed.

Results: The respondents were 36% male, 17% age 18-24, 40% age 25-44, 26% age 45-64, and 16% age 65 or older. Seventy-six percent were white. Forty-five percent reported a chronic illness with higher risk for influenza, 11% had asthma, 7% had diabetes, 25% had hypercholesterolemia, and 28% had hypertension. Predictors for receipt of influenza vaccine were older age, presence of a primary care provider, health insurance, and employment. Those with chronic diseases were more likely to receive vaccination when compared to the general population. Among those 65 and older, blacks were less likely to receive the vaccine, OR (0.57), CI 95% (0.43, 0.76).

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Conclusion/Discussion:

Influenza vaccine was given to the majority of the members of high-risk groups but was not uniformly distributed in this community-based regional sample. Those who were under 65 were more likely to receive the vaccine if they had a chronic disease than if they did not, which accords with recommendations. However, for those reporting chronic diseases, whites were more likely to receive the vaccine than blacks. In those over 65, the rates of vaccination were highest, corresponding to the increased urgency of recommendations by the Centers for Disease Control and Prevention (CDC) to vaccinate this population. However, there were systematic disparities between the two races in receipt of vaccine that were only moderated by the self-reported history of asthma.

In high risk minority populations, there continues to be a disparity in access to vaccination. In previous studies, vaccination has been related to encouragement from physicians.[20, 21] Since physicians must often convince patients to take a vaccine when he or she does not want to be vaccinated, an additional step of behavioral modification is likely needed to insure vaccination of elderly and other high risk groups. In addition, there may exist a difference in a physician's likelihood of recommending vaccines in different subpopulations as exists in the literature for such procedures as dialysis, renal transplant, and cardiac procedures[22-24]

It is important to note that patient factors can influence immunization including the belief that flu vaccine causes influenza. Physicians may have an additional hurdle to increasing the rates of vaccination in subpopulations with this belief. In a small survey from England, 50% of respondents believed flu vaccine can make someone ill.[25] This belief has been shown to influence vaccination rates, [26] and it is possible that it impacts the rate of vaccination in minority populations, if they exhibit less trust in the medical system and less knowledge of physiological mechanisms of disease.

Our sample has both strengths and weaknesses. We have assessed a regional community to evaluate the community-wide acceptance of a vaccine recommended nationally for many years with known efficacy. We assessed this sample using random-digit dialing methods to limit bias in assessment and used weighting for the Davidson County population which gives us the ability to generalize to the entire county population as well as subpopulations of interest. However, since 10% of the U.S. population does not have a telephone number, these subpopulations are not included in this analysis. In addition, we have only gathered self-reported information on receipt of vaccines and of chronic diseases. This likely represents an underestimation of such chronic diseases as hypertension, hypercholesterolemia, and diabetes. In addition, we did not question respondents regarding several other chronic diseases which are at high risk for influenza including HIV related disease, kidney and liver disease, or cancers. These are likely to represent much smaller proportions of patients than those with asthma, hypertension, and diabetes.

This study reiterates the need to improve community-based strategies to improve evidence-based compliance with preventive health maintenance tasks by physicians. Patient level interventions can likely help us reach the goal of total immunization in high risk populations, and physician practices are annually reminded of the need to provide flu vaccine. However, more systematic and annual social marketing methods targeting high-risk groups and encouraging influenza vaccine may be needed to improve the rates of influenza vaccines in the community. [27] These messages are most important to subgroups of the community who are at highest risk, such as the elderly with chronic diseases. They are also important in subpopulations, such as blacks, who still lag behind in vaccine reception after years of public health efforts. These marketing techniques may aid physicians, other health plans, and health departments or agencies to reach influenza vaccination guideline goals.

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Community Scholars Partnership Program: Catalyzing Communities Towards Healthy Lifestyles

Rhonda BeLue, Ph.D., Policy Analyst

In April 2004, the first class of Scholars completed the Community Scholars Partnership curriculum co-sponsored by Metro Public Health Department's (MPHD) Research and Evaluation and Community Public Health Education and Promotion Programs.

Goals and Scope of the Community Scholars Program

1) Encourage members of community organizations and community activists to initiate actions geared towards health promotion, program development, and needs assessments in their own communities and to support policies that improve community health status;
2) Focus community attention and action on health improvement initiatives by involving community members;
3) Create lasting partnerships between MPHD and community agencies with the intention to assist in the maintenance and progression of scholar and MPHD initiated programs and community behavior changes as well as the continued development of the scholar as a community health promoter and community health evaluator; and
4) Capture emerging knowledge and translate research into community-based interventions.

Community Scholars

Participating teams consist of community members along with Metropolitan Public Health Department staff who are key to creating a healthy community and are interested in implementing research, educational interventions, health promotion programs, or conducting needs assessments in their communities.

Scholar Competencies to Be Obtained during the Course of the Program

1) Understanding of the components of public health practice and the health care system in Nashville and the U.S. and the role that community organizations play in public health practice;
2) Foundations of health behavior and how to create and encourage behavior change in communities;
3) Understanding of the role of partnerships in health planning and promotion;
4) Ability to find and read the current literature and apply results to community health initiatives;
5) Understanding of the components of a community needs assessment/evaluation; and
6) Understanding of the components of a community health intervention.

Participating Teams 2003-2004

1) Obesity Team: Team members represented the Upper Room, Figures of Nashville, and National Public Radio.

2) Child Literacy Team: Team members represented MPHD's Children's Special Services and the Nashville Downtown Library.

3) Teen Pregnancy Prevention Team: Team members represented Planned Parenthood and the Nashville Teen Pregnancy Coalition.

Curriculum 2003-2004

A total of 10 sessions were completed during the scholars' tenure at MPHD. Beginning sessions were conducted to provide information and structure for later project development. Later sessions also involved the review and discussions of the book *Community Based Participatory Research for Health* by Minkler and Wallerstein.

Session Content

- Session I: Introduction, schedule, and objectives.
- Session II: How to conduct a literature review for public health education, interventions, and research.
- Session III: The MAPP process: **M**obilizing for **A**ction through **P**lanning and **P**artnerships (MAPP) is a strategic approach to community health improvement. This tool helps communities improve health and quality of life through community-wide strategic planning.
- Session IV: Creating partnerships and cultural competency.
- Session V: Logic models and evaluation of community based projects.
- Session VI: Institutional Review Board.
- Session VII: The goal of the session was to answer specific planning questions regarding the team project.

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The objective of my project is:
Population: Whom am I targeting?
How will I target them?
What is my expected outcome? What do I expect to see?
What difference in my outcome is important?
How will I achieve my outcome? How will I measure my outcome? Do I have a baseline measurement of my outcome?
What else do I need to measure that might effect my outcome and how will I get the information?
Has my proposed intervention been used to affect the outcome I am interested in?
How exactly will my intervention affect my outcome? How many times must participants receive intervention to affect the outcome?

- Sessions VIII- IX: Discussion of project implementation, monitoring of the project process, and preparation of National Public Health Week posters.

- Session X: Update on implementation and plans for evaluation of project.

Team Projects

Obesity Team

Project Summary

The Obesity Team has plans for a community forum designed to address the positive side of plus-sized women. The forum will provide health information, motivational speeches, and support for women trying to make healthy lifestyle changes. A logic model and customer satisfaction surveys have been developed to evaluate the forum.

Goals/Expected Outcomes

- Five walking clubs or other health and wellness programs established throughout the community;
- Increased awareness about the effects of obesity;
- Feedback delivered through email and postage paid postcards;
- Ten women trained to lead additional forums in local communities; and
- Annual forum to discuss, monitor, and celebrate progress.

Partners

Partners include Metropolitan Public Health Department's Community Scholars and Health Promotion programs and Project REACH 2010, a community intervention to reduce and eliminate health disparities associated with heart disease and diabetes among blacks in North Nashville.

Evaluation

The forum will take place in November 2004. The Obesity Team will have ongoing meetings with the Community Scholars Program staff until the event has been conducted and properly evaluated.

Teen Pregnancy Team

Project Summary

The Teen Pregnancy Team will target adolescent males ages 10-17 in Boys and Girls Club's after-school programs. Participants will receive educational sessions utilizing age-appropriate sexuality information. Participants will be divided into two groups: males aged 10-13 and males aged 14-17. The 10-13 year old group sessions will include instruction on self-esteem, decision-making skills, goal-setting, anatomy, and puberty. The 14-17 year old group will receive instruction on healthy relationships, decision-making skills, and avoidance of sexual risks. Participants will take a pre- and post- tests to measure increase in knowledge as well as baseline measurements of self-esteem. Male instructors will facilitate each of the 4-6 sessions and will participate in follow-up mentoring sessions.

Goals/Expected Outcomes

1) Increase in self- esteem and

2) Increase in knowledge of pregnancy prevention techniques and sexuality information (including decision-making skills, abstinence, and safer sex strategies).

These increases will impact teen pregnancy by helping adolescent males make healthier sexual decisions.

Partners

Partners include Planned Parenthood of Middle and East Tennessee, the Boys and Girls Clubs, MPHD's Health Promotion Adolescent Pregnancy Prevention Program, Lentz Health Clinic at MPHD, and the School Health nurses in the Metropolitan Nashville Public Schools.

Evaluation

The teen pregnancy team is currently discussing the feasibility of following a cohort of youth to measure long-term outcomes. Issues regarding sustainability of this curriculum are also ongoing to assure that the effect of the

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programs will last past the implementation of this particular series.

Child Literacy Team

Project Summary

The Child Literacy Team aims to improve the reading comprehension of deaf and hearing impaired children. A pilot group of teachers and hearing impaired students will be educated by Metro Public Health Department and Nashville Public Library regarding the resources available in the community, specifically at the library.

Teachers and students will participate in a new program at the Downtown Library. This program involves sharing the written word with these students and offering, through unique programming, a "whole child learning" approach to introduce early literacy skills.

Students will visit the library on a number of occasions. The number of encounters necessary to see change in literacy will be determined during the pilot phase of the program.

Goals/Expected Outcomes

1) Use the library and story sharing with a "whole child" approach (interactive and incorporating art, drama, and music) to capture child's attention and increase literacy;

2) Model different approaches to storytelling to show importance of incorporating books into the classroom; and

3) Educate teachers of hearing impaired students regarding library services and programs.

The Child Literacy Team hopes to encourage and train teachers through this library program to model best practices for use with children in their individual classrooms.

Partners

Partners include Metro Public Health Department's Children's Special Services, Metro Public Library, and teachers in Metro Public Schools' hearing impaired classrooms.

Evaluation

Teachers will be given a pre-post test that is geared to assess knowledge of the library program as a resource for their students. Teachers will then receive a follow-up survey regarding classroom interest in reading and any observed improvement in literacy. Scholars are currently trying to obtain permission to collect data on the students that participate in the program.

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Reported Cases of Selected Notifiable Diseases for March/April 2004

Disease	Cases Reported in March/April		Cumulative Cases Reported through April	
	2003	2004	2003	2004
AIDS	28	47	69	88
Campylobacteriosis	3	3	3	5
Chlamydia	538	499	942	815
DRSP (Invasive drug-resistant *Streptococcus pneumoniae*	9	1	13	7
Escherichia coli 0157:H7	0	0	0	0
Giardiasis	3	3	7	7
Gonorrhea	257	207	501	381
Hepatitis A	3	0	3	11
Hepatitis B (acute)	7	0	9	2
Hepatitis B (perinatal)	5	4	10	15
HIV	50	65	89	103
Influenza-like Illness	53	19	917	179
Neisseria meningitidis disease	0	1	0	1
Salmonellosis	7	5	12	10
Shigellosis	3	2	5	4
Syphilis (primary and secondary)	6	2	9	3
Tuberculosis	10	11	20	19
VRE (Vancomycin-resistant enterococci)	16	3	22	17

To report a notifiable disease, please contact:

Sexually transmitted diseases: Brad Beasley at 340-5676
AIDS/HIV: Mary Angel-Beckner at 340-5330
Hepatitis B: Denise Stratz at 340-2174
Tuberculosis: Alisa Haushalter at 340-5650
Hepatitis C: Pat Sanders at 340-5632
Vaccine-preventable diseases: Mary Fowler at 340-2168
All other notifiable diseases: Pam Trotter at 340-5632

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